THE ROLE OF SUPPLIER-BUYER RELATIONSHIPS ON THE SUSTAINABILITY OF HYDROPONIC VEGETABLE SUPPLY CHAINS IN THE CIREBON REGION

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Abstract

Amidst challenges such as climate change, and the increasing demand for organic food, hydroponic farming has become an attractive option for farmers and businesses. Seeing this, the supplier-buyer relationship itself plays an important role in meeting market demand for the sustainability of the supply chain. The problem statement for this research is how buyer-supplier relationships and their effects on supply chain sustainability are influenced by the quality of communication (X1), relationship commitment (X2), and cooperation (X3). This research aims to ascertain how cooperation with buyer-supplier relationships, relationship commitment, and communication quality affect supply chain sustainability. With a sample size of 110 respondents12 farmers and 98 buyers. SmartPls 3.0 is the methodology employed. The study's findings indicate that supplier-buyer relationships are positively and significantly impacted by cooperation, relationship commitment, and communication quality. Additionally, supplier-buyer relationships can mediate the impact of these three factors on supply chain sustainability.

Keywords: Communication Quality, Relationship Commitment, Cooperation, Supplier-Buyer Relationship, Supply Chain Sustainability

INTRODUCTION

The Indonesian economy heavily depends on the country's agriculture sector, particularly on vegetable commodities. Given their high demand and market absorption, vegetables including hydroponics are one area of the horticulture subsector with significant development potential (Asyifa & R. Eviyati, 2021). In the midst of challenges such as climate change, and the increasing demand for organic food, hydroponic cultivation has become an attractive option for farmers and business actors. From the results of a research in the European region by Romeo, et al (2018) in (Wijaya & Taufikurohman, 2022).

In Cirebon City itself, the trend of healthy living is one of the developments in interest in the consumption of fresh vegetables, especially organic / conventional and hydroponic vegetables. Cirebon City BPS Head Aris Budiyanto said that along with the increase in population, agricultural land in Cirebon City is getting smaller, while the need for agricultural products is increasing. According to the Head of BPS Cirebon City, Aris Budiyanto, population growth has led to a reduction in agricultural land in the region, while demand for agricultural products continues to increase. This situation has encouraged some city residents to switch to urban farming systems. Such conditions make some city residents choose to implement an urban farming model (Fathnur Rohman, 2024).

The supplier-buyer relationship itself plays an important role in meeting market demand. In this context, the supplier-buyer relationship does not only focus on buying and selling transactions and getting profits but also includes the quality of communication, relationship commitment that has an impact on long-term relationships, and close cooperation between suppliers-buyers, collaboration among suppliers also plays an important role in supporting the sustainability of the hydroponic supply chain. Cooperation between suppliers and buyers helps ensure smooth product distribution and builds long-term relationships. Meanwhile, collaboration among suppliers, which is part of the horizontal supply chain, enables joint production, collective marketing, and efficiency in resource procurement. To overcome this problem the buyer- supplier relationship is an important step for the sustainability of the supply chain. So that the supply of vegetables in the market can be fulfilled according to market demand. Good relationships between suppliers and buyers can improve operational effectiveness and support sustainable business practices in the supply chain (Paul et al., 2021)

Supply Chain Flow of Hydroponic Vegetables

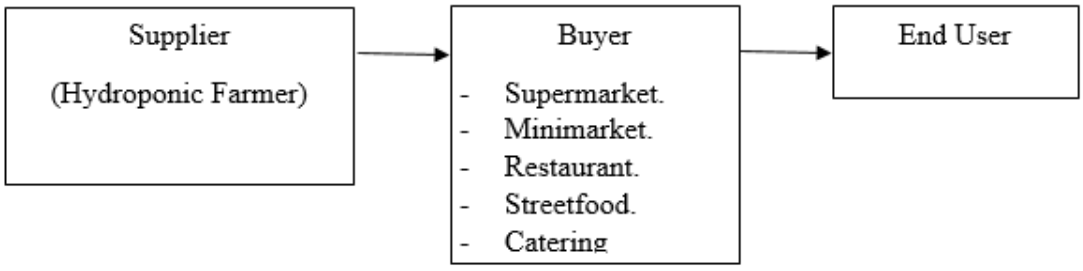

Figure 1
Supply Chain Flow of Hydroponic Vegetables

The following is an explanation of the flow of the picture above. The supplier (hydroponic farmer) produces fresh vegetables using the hydroponic method and harvests after the vegetables are ready. After harvesting, the vegetables are packaged properly to maintain their freshness before being sold. Furthermore, farmers directly supply the vegetables to buyers such as supermarkets, restaurants, or UMKM players. At the buyer's end, the vegetables are received and then prepared to be sold to the end consumer. The end consumer then buys the vegetables at supermarkets or other points of purchase for consumption. Thus, the supply flow starts from the hydroponic farmer, through the buyer, to the end consumer.

Seeing that most of the previous studies that raised this variable had more impact on supply chain performance, then only focused on one company or research object and did not discuss the sustainability of the supply chain, Affanto Ronald entitled "Analysis of the Effect of the Quality of Supplier Relationships with Companies on Supply Chain Performance" empirical research on raw material suppliers at PT Jamu Jago (Ronaldo Alfianto, 2015). While this research discusses the impact on the sustainability of the supply chain, then the objects studied are more than two objects of suppliers and buyers, so that they have a new concept in research.

Given the foregoing context, the researcher is motivated to carry out this research, where this research aimed to determine the Role of Buyer Supplier Relationships on Communication Quality, Relationship Commitment, Cooperation and Sustainability of Hydroponic Vegetable Supply Chains in the Cirebon Region.

REVIEW OF LITERATURE

Supply Chain Theory

Supply chain is a business activity that covers and involves several parties with the aim of increasing the added value of raw materials or products produced and distributing them to consumers. The supply chain connects various parties in economic activities, from raw material producers to the hands of end consumers. Basically, the supply chain aims to increase added value. In addition, the supply chain also plays a role in meeting consumer needs. In the process, each party involved in it contributes through certain inputs or processes that can increase the value of the product (K. A. Aziz, S. Marzuki, 2016).

Theory of Hydroponic Vegetables

In general, hydroponics refers to a technique for growing crops without the use of soil. "Hydro" (meaning water) and "ponos'' (meaning work) are the Greek terms from which hydroponics is derived (Mauliddiyah, 2021). Hydroponic vegetables are a type of plant that is cultivated without using soil media, where plant roots get nutrients from water solutions containing nutrients, the vegetables produced are generally more hygienic and minimal chemicals, both from nutrients, water, and lighting.

Supplier-Buyer Relationship Theory

In the hydroponic vegetable supply chain system, the correlation from suppliers such as hydroponic farmers or farmer groups and buyers such as minimarkets, supermarkets, and

restaurants has an important role in maintaining product quality, building sustainable partnerships, and smooth distribution from production to end consumers.

Communication Quality Theory

Communication quality is a measure of how well a message is conveyed and understood in an interaction. According to (Ronaldo Alfianto, 2015) Effective communication between suppliers-buyers is essential for smooth business processes. Without good communication, communication helps minimize uncertainty regarding quality, quantity, and delivery time, so that distribution to end consumers runs smoothly. Communication is said to be of high quality if the intention behind the message is successfully received and accurately interpreted by the other party, thus minimizing confusion and producing a response or understanding that is in line with the original intent.

Relationship Commitment Theory

According to Morgan and Hunt in (Mukhsin, 2020) commitment is a belief from a party, that establishing relationships with business partners is very important and can provide maximum benefits for both parties. They also emphasize that commitment, which is accompanied by cooperation, shows a strong desire to maintain a valuable partnership relationship in the long term.

Cooperation Theory

According to Metcalf et al in (Apriadi et al., 2024) states that planned cooperation is the result of trade practices that occur between providers and customers. Cooperation and change activities are key in the relationship. If cooperative activities and actions are positive, it will result in commitment and end results that maintain the efficiency, productivity and effectiveness of a relationship (Mukhsin, 2020).

Supply Chain Sustainability Theory

The process of regulating the movement of resources, information, and funds as well as cooperation amongst supply chain organizations while accounting for economic, environmental, and social factors in line with stakeholder and customer needs is known as supply chain sustainability (Stevan seuring, 2008).

RESEARCH METHOD

This research employs survey methods to collect quantitative data. Sugiyono claims that quantitative research is a positivist approach that focuses on examining particular populations or samples. To support the established hypothesis, data is gathered using research instruments and statistically examined (Prof. Dr. Sugiyono, 2021).

This research adopted a saturated sampling technique, involving a total of 110 respondents. Of these, 12 respondents were hydroponic suppliers, while the remaining 98 respondents were buyers of hydroponic vegetables, covering various entities such as supermarkets, minimarkets, food MSMEs and restaurants. In accordance with the analysis tool that we will use in this research is SmartPLS with the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach. Partial Least Squares (PLS), or what is popularly known as Smart PLS. For the ideal sample size for using Smart PLS, see from (Joseph F. et

al., 2014), namely where the number of indicators is 19 multiplied by 5 (19 x 5 = 95). So from this, the number of samples to be studied is at least 95 respondents.

The variables in this research consist of: 1. Communication Quality (X1) obtained from (Ronaldo Alfianto, 2015) includes: (CQ1) Amount of communication, (CQ2) Communication content, and (CQ3) Communication feedback; 2. Relationship Commitment (X2) obtained from Morgan and Hunt, 1994 in (Mukhsin, 2017) includes indicators (RC1) Affective, (RC2) Continuance, (RC3) Normative, and (RC4) Confidence; 3. Cooperation (X3) obtained from Cempakasari & Yoestini, 2003 in (Christofer & Memarista, 2019) includes indicators (C1) Understanding of company needs, (C2) Smooth movement of goods and (C3) Relationships; 4. Supplier-Buyer Relationship (Z) obtained from Sivesan (2012) in research (Ruin, Lusiana Mali and Gusliana, 2019) includes indicators (SBR1) Trust, (SBR2) Conflict handling, and (SBR3) Satisfaction of supplier-buyer relationships; 5. Supply Chain Sustainability (Y) obtained from Cetinkaya et al. (2011) in (Septarianes, 2020) there are three dimensions (Economic, Social, and Environmental) where each dimension has two indicators including Economic Aspects: (SCS1) Product availability, and (SCS2) Responsiveness to customers / companies), Social Aspects: (SCS3) Employment and (SCS4) Sustainability of living standards, Environmental Aspects: (SCS5) Waste utilization and (SCS6) Waste management.

For data collection, this research utilized a comprehensive research instrument, consisting of a questionnaire presented in the form of structured interviews and direct observation at the research location. The collected data were then analyzed quantitatively/statistically using SmartPLS SEM software. This analysis approach was chosen specifically for the purpose of testing the hypotheses that have been formulated, thus enabling researchers to draw valid and reliable conclusions from the data obtained.

Research Hypothesis

H1: Communication quality has a positive effect on supplier-buyer relationships.
H2: Relationship commitment has a positive effect on supplier-buyer relationships.
H3: Cooperation has a positive effect on supplier-buyer relationships.
H4: Supplier-buyer relationships have a positive effect on supply chain sustainability.

Contextual Framework

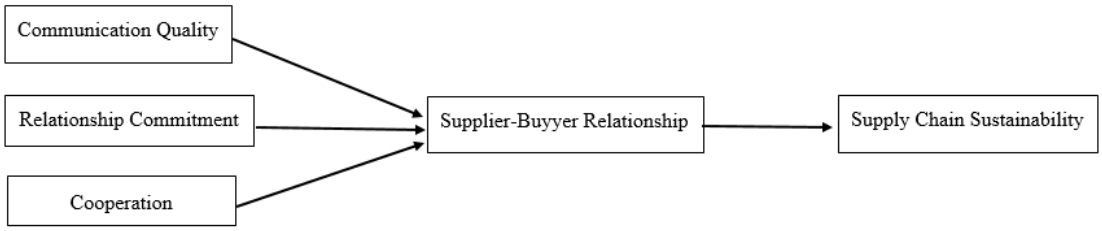

Figure 2
Contextual Framework

This research focuses on suppliers or hydroponic farmers and buyers of hydroponic vegetables throughout Cirebon, covering both the city and regency. The main objective is to identify the factors that influence the correlation between these suppliers and buyers of

hydroponic vegetables. Furthermore, we will analyze whether these factors can contribute to the sustainability of the hydroponic vegetable supply chain in the Cirebon region.

RESULTS AND DISCUSSION

Measurement Model

The measurement model includes tests to assess the validity and reliability of research instruments. The validity test is used to determine and ensure that each question item in the questionnaire truly reflects the variables to be studied before distributing 110 questionnaires to research participants. Meanwhile, the Reliability Test ensures that all indicators in one construct support each other consistently. This measurement model serves to measure the extent to which indicators have a significant relationship to latent variables. A value above 0.7 indicates that the indicator is valid and strong enough to be used in the analysis.

Construct Validity Test

Abdillah and Jogiyanto 2015 in (Mukhsin, 2022) said, construct validity shows how the results obtained both from a use and measurement are in accordance with the theories used to define a construct. The main objective is that the data obtained is appropriate and can be used to analyze the correlation from variables appropriately, so that the research results become more accurate and reliable.

Table 1
Outer Loading

Variable	Item Code	Outer Loadings	Description
Communication Quality (X1)	CQ1.1	0,866	Valid
	CQ1.2	0,863	Valid
	CQ2.1	0,811	Valid
	CQ2.2	0,798	Valid
	CQ3.1	0,873	Valid
	CQ3.2	0,867	Valid
Relationship Commitment (X2)	RC1.1	0,753	Valid
	RC1.2	0,816	Valid
	RC2.1	0,802	Valid
	RC2.2	0,781	Valid
	RC3.1	0,773	Valid
	RC3.2	0,818	Valid
	RC4.1	0,841	Valid
	RC4.2	0,777	Valid

Cooperation (X3)	C1.1	0,797	Valid
	C1.2	0,825	Valid
	C2.1	0,846	Valid
	C2.2	0,766	Valid
	C3.1	0,789	Valid
	C3.2	0,785	Valid
Supply Chain Sustainability (Y)	SCS1	0,821	Valid
	SCS2	0,817	Valid
	SCS3	0,842	Valid
	SCS4	0,875	Valid
	SCS5	0,834	Valid
	SCS6	0,762	Valid
Supplier-Buyer Relationship (Z)	SBR1.1	0,748	Valid
	SBR1.2	0,829	Valid
	SBR2.1	0,752	Valid
	SBR2.2	0,727	Valid
	SBR3.1	0,828	Valid
SBR3.2	0,830	Valid	

Source: Primary Data Processed With SmartPLS, 2025

From the results obtained in table 1, it explains that the outer loading value of all variable indicators X1, X2, X3, Z, and Y is greater than 0.7, indicating that all question instruments are valid. The expected loading factor value is> 0.7 according to Hussein, 2015 in (Mukhsin, 2022).

Factor Loading Communication Quality Variable

The Communication Quality variable (X1) is measured using three indicators, where each indicator has two questions, namely CQ1.1 to CQ3.2. To assess how strong the correlation from each indicator and the construct it represents is, outer loading factor testing is carried out. According to Ghozali (2006) in (Mukhsin, 2017), ‘’an indicator is categorized as reliable if it has a loading value of more than 0.7”. However, a minimum value of 0.5 is still acceptable in the early stages of model development. From the results of the analysis carried out through SmartPLS, all instruments on the indicators on the Communication Quality variable show a high outer loading factor value, where CQ1.1= 0.866, CQ1.2= 0.863, CQ2.1= 0.811, CQ2.2= 0.798, CQ3.1= 0.873, CQ3.2= 0.867. These values indicate that all indicators have a very good correlation to the Communication Quality construct. This indicates that the indicators consistently and accurately represent the variable in question. Thus, it can be concluded that the Communication Quality construct has met the requirements

of convergent validity and is declared reliable and valid, so it is suitable for use in the next stage of analysis in the structural model.

Factor Loading of Relationship Commitment Variable

The Relationship Commitment variable (X2) consists of four indicators, where each indicator has two questions, starting from RC1.1 to RC4.2, as shown in Table 1. Evaluation is carried out through outer loading factor analysis to determine the extent to which these indicators represent the intended construct. From guidance from Ghozali (2006) (Mukhsin, 2017), Although the lowest value of 0.5 is still acceptable at the development stage, a loading value greater than 0.7 suggests that the indicator is dependable. All of the indicators in this variable, including RC1.1 = 0.753, RC1.2 = 0.816, RC2.1 = 0.802, RC2.2 = 0.781, RC3.1 = 0.773, RC3.2 = 0.818, RC4.1 = 0.841, and RC4.2= 0.777, have outer loading values above 0.7, according to the analysis results using SmartPLS. These values indicate that each indicator has a strong contribution to the Relationship Commitment construct. Therefore, it can be concluded that this variable has met the requirements of convergent validity and discriminant validity, so it can be used in further structural model testing.

Factor Loading of Cooperation Variable

The Cooperation Construct (X3) is formed by three main indicators, where each indicator has two questions, namely C1.1 to C3.2 The strength of the association between each indicator and its concept is measured using outer loading factor analysis, which is used to evaluate the quality of indicators. According to the standards established by Ghozali (2006) in (Mukhsin, 2017), an indicator is considered valid if its loading value is larger than 0.7, even though a loading value greater than 0.5 is still acceptable during the development stage. The results of data processing using SmartPLS show that every indication on the Cooperation variable indicates a high outer loading factor value. The values are C1.1 = 0.797,C1.2= 0.825, C2.1 = 0.846, C2.2 = 0.766, C3.1= 0.789, and C3.2 = 0.785. All of these values are above the minimum recommended limit, thus indicating that each indicator has a significant contribution in forming the Cooperation construct. Thus, it can be said that the Cooperation variable has met the requirements of convergent validity statistically, which indicates that the indicators used can represent the construct consistently and accurately in the measurement model.

Factor Loading of Supply Chain Sustainability Variables

The Supply Chain Sustainability variable consists of three dimensions in which there are two indicators, where each indicator has one question, namely SCS1 to SCS6 As shown in Table 1. To determine the extent to which these indicators are able to reflect the construct being measured, outer loading factor testing is carried out. From Ghozali's (2006) criteria in (Mukhsin, 2017), indicators are declared reliable if they have a loading value above 0.7, although in the early stages of model development, a minimum value of 0.5 is still acceptable. From the results of analysis using SmartPLS, all indicators shows a strong outer loading factor value, namely SCS1 = 0.821, SCS2 = 0.817, SCS3 = 0.842, SCS4= 0.875, SCS5= 0.834, and SCS6= 0.762. All of these values are above 0.7, indicating that the indicators are able to explain the construct well. Thus, the Supply Chain Sustainability variable is declared to meet the criteria of convergent validity and discriminant validity, so it can be concluded that the indicators used in measuring this variable have proven to be valid and reliable and are suitable for use in further model testing.

Factor Loading of Supplier-Buyer Relationship Variables

The Supplier-Buyer Relationship variable is represented by three indicators, namely SBR1.1 to SBR3.2, as described in Table 1. To evaluate the extent to which each indicator reflects the intended construct, testing of the outer loading value is carried out. From the guidelines proposed by Ghozali (2006) in (Mukhsin, 2017), indicators are declared reliable if they have a loading value above 0.7. However, in the model development stage, the minimum value of 0.5 is still considered acceptable. From the results of the analysis using SmartPLS, all indicators on the Supplier-Buyer Relationship variable show an outer loading value above 0.7, namely: SBR1.1 = 0.748, SBR1.2 = 0.829, SBR2.1 = 0.752, SBR2.2 = 0.727, SBR3.1 = 0.828, SBR3.2= 0.830. All these values indicate that the three indicators consistently and significantly represent the construct of the Supplier-Buyer Relationship. This indicates that this variable has met the criteria for convergent validity, where each indicator has a strong correlation with the main construct. In addition, the indicators are also declared to meet discriminant validity, it is found that the indicators are able to distinguish the Supplier-Buyer Relationship construct from other constructs in the model. Therefore, this variable can be said to be valid and reliable, and is suitable for use in the next stage of structural analysis.

Average Variance Extracted (AVE)

AVE is a measure of convergent validity that shows how much indicators explain the constructs they represent.

Table 2
AVE value

Variable	Average Variance Extracted (AVE)	Description
Buyer-Buyer Relationship (Z)	0,619	Valid
Supply Chain Sustainability (Y)	0,682	Valid
Cooperation (X3)	0,643	Valid
Relationship Commitment (X2)	0,633	Valid
Communication Quality (X1)	0,717	Valid

Source: Primary Data Processed with SmartPLS, 2025

From the results obtained in Table 2, each variable's AVE value is greater than 0.5, indicating that discriminant validity is met. Hussein (2015) states that the projected average variance extracted (AVE) value is more than 0.5 in (Mukhsin, 2022). According to the Average Variance Extracted (AVE) value, the data processing results demonstrate that every construct in this study satisfies the requirements for convergent validity. Hair et al. (2014) state in (Haji-Othman et al., 2024) that a good AVE score is at least 0.5, meaning that the latent construct being measured correctly explains more than 50% of the indicator variance. Stated otherwise, the better the indications describe the construct, the higher the AVE value. In this research, the Communication Quality variable (X1) has the highest AVE value of 0.717, which means that 71.7% of the indicator variance is explained by the construct. Followed by the Supply Chain Sustainability variable (Y) with an AVE value of 0.682 (68.2%), Cooperation (X3) of 0.643 (64.3%), Relationship Commitment (X2) of

0.633 (63.3%), and Supplier-Buyer Relationship (Z) of 0.619 (61.9%). All AVE values are above the recommended minimum limit, which indicates that the indicators on each variable have good internal consistency in measuring constructs.

Reliability Test

A reliability test ensures that all indicators within a single construct consistently support one another. A good reliability value reflects that the response from the indicator is stable and reliable in measuring the construct, which can be seen in the following table:

Table 3
Cronbach's Alpha & Composite Reliability

Variable	Cronbach's Alpha	Composite Reliability	Description
Supplier-Buyer Relationship (Z)	0,876	0,907	Realiable
Supply Chain Sustainability (Y)	0,907	0,928	Realiable
Cooperation (X3)	0,889	0,915	Realiable
Relationship Commitment (X2)	0,917	0,932	Realiable
Commitment Quality (X1	0,921	0,938	Realiable

Source: Primary Data Processed with SmartPLS, 2025

From the results of table 3 above, the results of testing the instrument produce a value that can be seen that the value of crombach alpha, composite reliability, the five variables have met the requirements to be said to be reliable. The value obtained in the table above shows that it exceeds 0.7, which is higher than the standard.

According to Ghozali 2006 in (Mukhsin, 2017) a data is considered reliable if the composite reliability value > 0.7. This means that the measurements taken produce consistent and stable results if repeated. In research (Nurdiant et al., 2017) explains that all variables in the study can be said to be good, because they have a *Composite Reliability value> 0.7* and a value of *Cronbach'* Alpha> 0.6.

Structural model

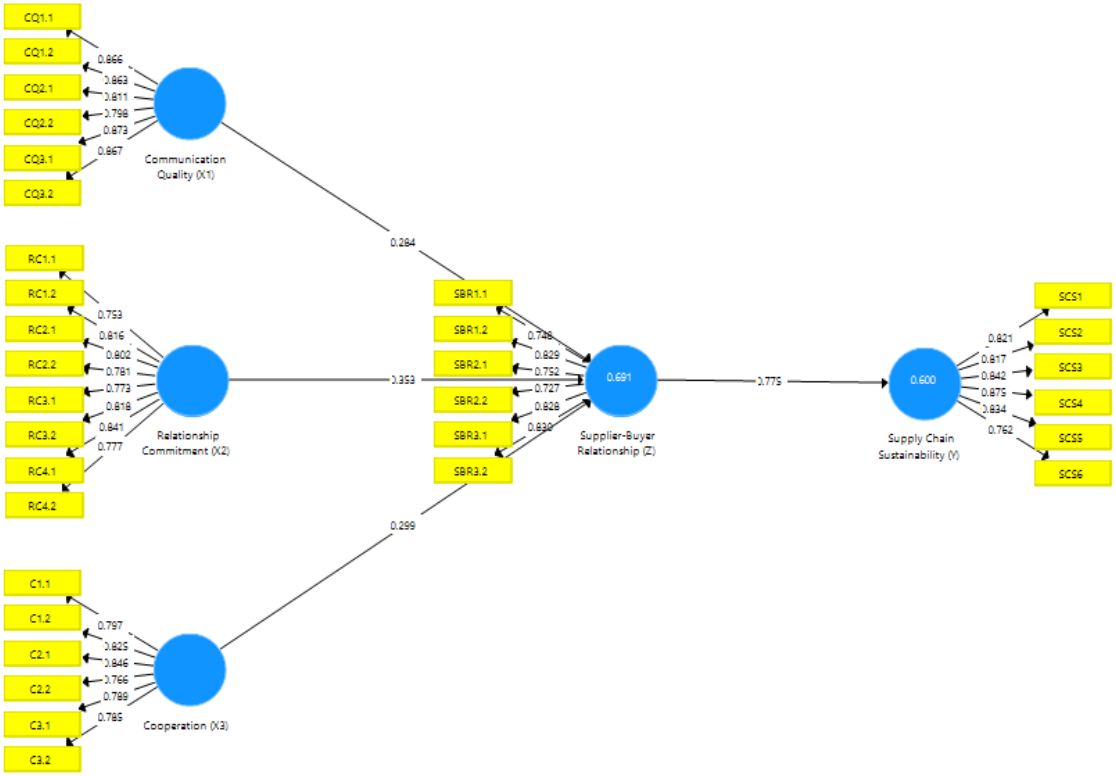

Figure 3
Inner Model Results (Bootstrapping)

R Square Value

R Square quantifies the percentage of variance in the value of the endogenous variable that can be accounted for by the exogenous variables influencing it. The value of R suare can also be seen Seeing from Sarstedt, 2017 in (Furadantin, 2018) there are several criteria for R2 to be accepted, namely as follows: If R2= 0.75 (large / strong), if the value of R2 = 0.50 (medium) if the value of R2 = 0.25 (weak).

Table 4
Test R Square

Variable	R Square	R Square Adjusted	Description
Supplier-Buyer Relationship	0,691	0,682	Medium
Supply Chain Sustainability	0,600	0,597	Medium

Source: Primary Data Processed with SmartPLS, 2025

The table above displays the results of the R square value of this research, namely: R square of path model I for Supplier-Buyer Relationship = 0.691. This means that the ability of the independent variables Communication Quality, Relationship Commitment, and Cooperation to explain that the effect on the Supplier-Buyer Relationship is 69.1%

(medium). Then R square on path II for Supply Chain Sustainability = 0.600. This means that the ability of the variables of Communication Quality, Relationship Commitment, Cooperation in explaining Supply Chain Sustainability is 60.0% (medium). The greater the R Square value, the stronger the ability of the independent variables to explain the dependent variable, which in turn reflects the better quality of the structural model built (Mukhsin, 2017).

Total Effect

Table 5
Total Effect

	Supplier-Buyer Relationship (Z)	Supply Chain Sustainability (Y)
Supplier-Buyer Relationship (Z)		0,775
Supply Chain Sustainability (Y)		
Cooperation (X3)	0,299	0,231
Relationship Commitment (X2)	0,353	0,273
Communication Quality (X1)	0,284	0,220

Source: Primary Data Processed with SmartPLS, 2025

From the results of the analysis using SmartPLS displayed in table 6 Total Effect, it can be concluded that all variables in this research model have an influence on supply chain sustainability (Y). The highest total effect value on supply chain sustainability comes from the Supplier-Buyer Relationship variable (Z) with a value of 0.05.(Z) with a value of 0.775, which indicates that a strong correlation from suppliers and buyers greatly contributes to supply chain sustainability. Furthermore, the Relationship Commitment variable (X2) has an influence of 0.273, followed by Cooperation (X3) at 0.231, and Communication Quality (X1) at 0.220. This shows that although all variables make a positive contribution, the correlation from suppliers and buyers is the most dominant factor because it has the largest value with other variables.

Meanwhile, in shaping the supplier-buyer relationship (Z), Relationship Commitment (X2) provides the greatest influence with a value of 0.353, followed by Cooperation (X3) at 0.299, and Communication Quality (X1) at 0.284. Thus, to build effective supply chain sustainability, it is important to strengthen commitment, cooperation, and communication quality which then form a solid correlation from suppliers and buyers so that in the end this relationship can be improved.

Path Coefficient

Path coefficient or inner model is used to test the direct influence between constructs. evaluation is done by looking at the R-square value, as well as hypothesis testing for significance on the path between variables through the t-statistic value and p- value. A variable has a unidirectional effect if the route coefficient value is positive. In the event that

an exogenous variable's value rises, the endogenous variable's value likewise does. A variable's effect is in the opposite direction if the route coefficient value is negative. Endogenous variables have a negative value if the value of an exogenous variable rises. We must consider the value of path coefficients in order to test the given hypothesis and determine the significance and degree of the association from variables. Furadantin (2018) P value, or probability/significance value: P-values are considered significant if they are less than 0.05, and not significant if they are greater than 0.05.

Table 6
Path Coefficients

Variable	Original Sampel (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistik (O/STDEV)	P Values
Supplier-Buyer Relationship → Supply Chain Sustainability	0,775	0,779	0,040	19,206	0,000
Cooperation → supplier-Buyer Relationship	0,299	0,302	0,122	2,446	0,015
→ Relationship Commitment Buyer Supplier Relationship	0,353	0,345	0,117	3,016	0,003
Communication Quality → Buyer Supplier Relationship	0,284	0,289	0,106	2,676	0,008

Source: Primary Data Processed with SmartPLS, 2025

From the results of hypothesis testing using SmartPLS in this research, it is known that Hypothesis 1 is accepted, which shows that communication quality has a significant effect on supplier-buyer relationships. The path coefficient value is 0.284, then the statistical T value is 2.676> 1.960. The p-value is 0.008, which itself is below 0.05. The quality of effective communication between suppliers-buyers is very important for smooth business process. According to (Ronaldo Alfianto, 2015) communication can be analogized as an adhesive that unites all parties in the distribution channel, so that all processes can run in a coordinated and efficient manner.

In Hypothesis 2, it shows that relationship commitment has a significant effect on the supplier-buyer relationship. With a path coefficient value of 0.353, then the statistical T value is 3.016> 1.960 and the p-value is 0.003 which is below 0.05. It can be concluded that commitment in the supplier-buyer relationship is an important factor in maintaining a mutually beneficial business relationship. The higher the commitment built from satisfaction and trust, the greater the channel correlation from supplier- buyer (Ronaldo Alfianto, 2015).

In Hypothesis 3, it shows that cooperation has a significant effect on the supplier-buyer relationship. With a path coefficient value of 0.299, then the statistical T value is

2.446> 1.960 and the p-value is 0.015, which is below 0.05. According to previous research, Anderson and Narus (2021) in (Apriadi et al., 2024) state that cooperation is not just a working relationship, but rather a tangible form of mutual desire, including the cooperation between suppliers and buyers.
from the retailers, to coordinate to achieve superior results.

Hypothesis 4 shows that the supplier-buyer relationship has a significant effect on supply chain sustainability. With a path coefficient value of 0.775, then the statistical T value is 19.206> 1.960 and the p-value is 0.000 which is below 0.05. According to previous research, good interactions between suppliers and buyers contribute to improving operational efficiency and encourage the implementation of sustainable business practices in the supply chain system (Paul et al., 2021).

This research investigates that the factors that influence Supplier-Buyer Relationships and how they positively influence supply chain sustainability in hydroponic vegetable supply chains in the Cirebon area, with a theoretical foundation of Relational View. Some studies also explain that
The influence of Trust, Commitment, Cooperation, and Information Sharing on Supply Chain Performance (Apriadi et al., 2024). Then research from (Paul et al., 2021) states that good relationship interactions between suppliers and buyers contribute to increased operational efficiency and encourage the implementation of sustainable business practices in the supply chain system.

In this research, statistical analysis was used to examine the direct correlation from communication quality, relationship commitment, and cooperation with supplier-buyer relationships, and their impact on supply chain sustainability. And the results show, that the supplier-buyer relationship is significantly affected by communication quality, relationship commitment, and cooperation. This research also reinforces the findings of previous studies which show that communication quality, relationship commitment, and cooperation are key drivers for strong relationships in supply chains.

The communication examined in this research can be explained through both theoretical approaches and practical conditions in the field. Effective communication between suppliers and buyers plays an important role in ensuring that information can be conveyed in a timely, clear and open manner, which is needed in handling perishable hydroponic products. The significant role of communication quality in building relationships between suppliers and buyers is also supported by the test results of the indicators used in this research. Some indicators such as the amount of communication, communication content, and communication feedback, this has also been tested in previous research, namely (Ronaldo Alfianto, 2015). Then in research from Stank et al. (1999) in (Ganika, 2016) examines the coordination process between companies formed from effective communication, information exchange, partnering, and monitoring company performance.

Meanwhile, relationship commitment also shows a significant influence on strengthening the correlation from suppliers and buyers. This result is obtained from testing four main indicators, namely affective, continuance, normative, and belief. Affective commitment is related to the emotional bond established due to mutual trust, while continuance commitment emphasizes awareness of long-term benefits and potential losses if the relationship is terminated. Furthermore, normative commitment is from a sense of

moral obligation to maintain the business relationship because it is considered a must. business relationship because it is considered an ethical imperative. This attitude often arises when both parties feel professionally responsible for continuing to collaborate, even in challenging situations. This Commitment variable has a significant effect on relationship quality, adopted and adapted from Morgan and Hunt, 1994 in (Mukhsin, 2017).

The cooperation variable also shows a significant influence on the quality of the correlation from suppliers and buyers, as evidenced and strengthened by the indicators of cooperation developed from the views according to Cempakasari & Yoestini, 2003 in research (Christofer & Memarista, 2019). Working together with trustworthy suppliers will lead to a thorough grasp of each party's needs, which will raise business revenue. Suppliers who understand the needs of buyers can adjust production capacity and maintain product quality, while buyers who realize the conditions and limitations of suppliers will be wiser in managing demand. This kind of collaboration creates synergies that support operational efficiency and improve supply chain performance. Thus, cooperation is not just a functional relationship, but an important foundation for the creation of mutually beneficial and sustainable business relationships. This is the reason why collaboration has a statistically significant effect on the correlation from suppliers and buyers.

These three factors synergistically strengthen the quality of the correlation from suppliers and buyers. This finding is also supported by the results of testing the fourth hypothesis, which shows that the correlation from suppliers and buyers significantly affects the sustainability of the supply chain, with a path coefficient value of 0.775, a T-statistic of 19.206, and a p-value of 0.000. These results confirm that the better the quality of relationships between parties, the greater the contribution to the creation of a sustainable supply chain. Some of these indicators refer to Sivesan (2012) in (Ruin, Lusiana Mali and Gusliana, 2019), there are three main indicators in customer relationships, namely trust, conflict handling, and relationship satisfaction. Trust is the main basis in maintaining the continuity of business relationships; when each party feels confident that their partners will act honestly and reliably, the risk of misunderstanding or reneging on commitments can be minimized. Commitment can be minimized. Good conflict handling is also an important element, as in long-term relationships it is inevitable that differences of interest will arise. The ability to resolve conflict fairly and constructively strengthens relationships and increases mutual understanding.

However, our research extends this understanding by not only confirming the positive impact on supplier-buyer relationships, but looking at how these factors contribute to supply chain sustainability. As such, this research not only replicates, but also extends the existing theoretical and empirical framework by providing a more comprehensive insight into the drivers of supply chain sustainability

CONCLUSION

The findings of this research conclude that continuous supply chain sustainability requires strong supplier-buyer relationships. To realize this, crucial factors such as high quality of communication, close relationship commitment, and solid cooperative efforts are required that collectively drive an effective correlation from suppliers and buyers. From the results of hypothesis testing from SmartPLS above, it also concludes the same thing that the

factors that influence Supplier-Buyer Relationships and how these factors positively affect the sustainability of hydroponic vegetable supply chains in the Cirebon area.

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